

## Welcome to the Joint Center for Satellite Data Assimilation

Effective environmental prediction depends on a number of critical elements. Accurate, timely, and well-distributed observations of the Earth's environment constitute one of these elements. Modern satellite sensors provide observations with an accuracy, coverage, and resolution essential for this task. Models embodying the physical and chemical laws governing the behavior of the Earth's land surface, oceans, and atmosphere, and powerful computers to run these models rapidly enough to make predictions useful are another two essential elements.

The science of satellite data assimilation is the mortar that binds these essential elements into a successful prediction system. The Joint Center for Satellite Data Assimilation (JCSDA) is dedicated to developing and improving the satellite data assimilation capability in key operational agencies in the United States.

This activity is best accomplished with a coordinated multi-agency basis as the common development work necessary to assimilate these many thousands of millions of satellite observations each day would otherwise be duplicated across the agencies.

John Le Marshall, PhD  
Director, JCSDA



### VISION

*A weather, ocean, climate and environmental analysis and prediction community empowered to effectively assimilate increasing amounts of advanced satellite observations from the evolving Global Earth Observing System of Systems (GEOSS).*

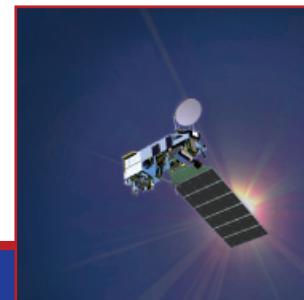
### MISSION

To accelerate and improve the quantitative use of research and operational satellite data in weather, ocean, climate and environmental analysis and prediction models.

*This is a substantial undertaking given the hundred-thousand fold increase in satellite data this decade from nearly fifty new instruments.*

### BACKGROUND

By the close of the 20<sup>th</sup> Century satellite scientists and program managers were not satisfied with the long time — typically two years — that elapsed between the launch of any new satellite and the use of data provided by its sensors for operational numerical weather prediction. Given the cost of these systems and their finite lifetimes — typically five years — it was realized that reducing the time from launch to operational use to one year represented a 33% improvement in productivity, and eliminated a costly missed opportunity for scientists and the public alike. Therefore, in 2001, the National Aeronautics and Space Administration (NASA) and National Oceanic and Atmospheric Administration (NOAA) formed the JCSDA to address this problem.



### PARTNERS

The key to the JCSDA's success is the partnership in which the resources and talents of several agencies are combined to solve problems of mutual interest. Shortly after its inception by NASA and NOAA, the JCSDA welcomed the Department of Defense (DoD) as a partner.

### JCSDA PARTNERS

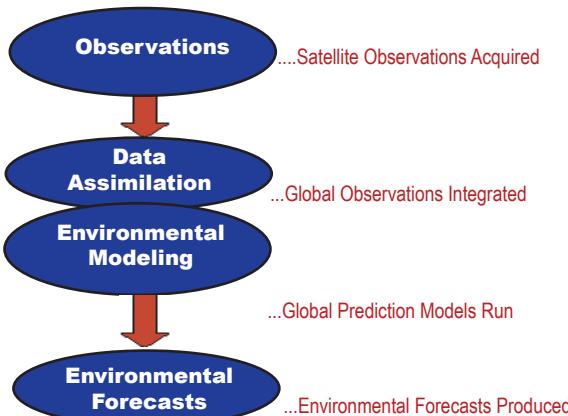
NASA Global Modeling & Assimilation Office	NOAA/NESDIS Center for Satellite Applications and Research
NOAA/NWS/NCEP Environmental Modeling Center	US Navy Oceanographer of the Navy, Naval Research Laboratory
NOAA/OAR Office of Weather & Air Quality	US Air Force AF Director of Weather AF Weather Agency

### Partner Contributions and Roles

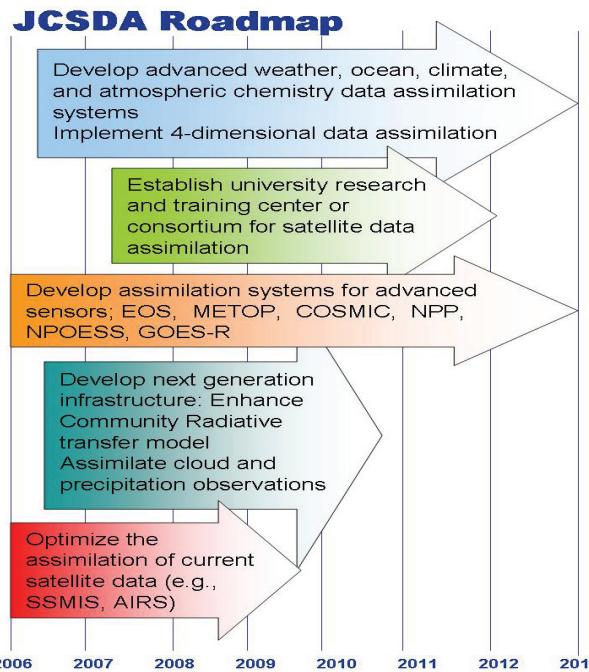
The JCSDA partners contribute to the mission by allocating personnel and infrastructure — facilities, space and computers — supporting JCSDA research and development projects. In addition, they pool funding for short-term, prioritized directed research projects by the partners, and support the annual opportunity for external researchers to contribute to the Center's mission.



## ROLE OF DATA ASSIMILATION



## THE FUTURE OF DATA ASSIMILATION AT JCSDA



## HIGHLIGHTS OF JCSDA ACHIEVEMENTS

Since its inception the JCSDA has made several significant strides in pursuit of its mission. The JCSDA has:

- Developed and distributed a Community Radiative Transfer Model (CRTM) to enable partners and collaborators to effectively test and commence the assimilation of various satellite data
- Established a common assimilation infrastructure at NOAA and NASA
- Provided access for all partners to computational facilities
- Demonstrated the positive impact on weather forecasts of data from advanced operational and research instruments
- Developed a microwave emissivity model for snow and ice that enables assimilation of 300% more atmospheric sounding data in polar regions
- Transitioned advanced satellite data into operations [e.g., QuikSCAT winds, MODIS winds, Atmospheric Infrared Sounder (AIRS) data.]
- Prepared to assimilate GPS data from COSMIC

### Contact Information

For more information about JCSDA activities, please contact: James G. Yoe, PhD, Deputy Director, JCSDA, 301-763-8172, ext 186, [james.g.yoe@noaa.gov](mailto:james.g.yoe@noaa.gov)

### References and Resources

Please refer to the JCSDA website: <http://www.jcsda.noaa.gov>, for additional references and resources



The Joint Center for  
Satellite Data  
Assimilation

